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IN THE

Supreme Court of the United States,

OCTOBER TERM, 1930.

(35,585)

THE PERMUTIT COMPANY,
Petitioner,

vs. No. [redacted]3.

GRAVER CORPORATION,
Respondent.

BRIEF FOR PETITIONER ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SEVENTH CIRCUIT.

DRURY W. COOPER,
GRAHAM SUMNER,
GEORGE A. CHRITTON,
ALLAN C. BAKEWELL,
Counsel for Petitioner.

The Evening Post Job Printing Office, Inc., 154 Fulton St., New York, N. Y.

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IN THE

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THE PERMUTIT COMPANY,
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vs.

GRAVER CORPORATION,
Respondent.

No. 663

BRIEF FOR PETITIONER ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SEVENTH CIRCUIT

Jurisdiction.

The date of decree to be reviewed was October 20, 1930. This cause is here on writ of certiorari granted by this Court March 2, 1931 on petition filed January 17, 1931. The jurisdiction of this Court was invoked under Judicial Code 240(a) as amended.

Opinions of the Courts Below.

This is a suit in equity brought in the United States District Court for the Northern District of Illinois, Eastern Division, by your petitioner, against Graver Corporation for infringement of claims 1 and 5 of Letters Patent No.

1,195,923 (R. 584) to Gans for Apparatus for Softening Water.

Petitioner seeks review of a decision of the Circuit Court of Appeals for the Seventh Circuit, affirming the decree of Judge Lindley entered in the District Court, holding invalid claims 1 and 5 of said Gans patent in suit.

The opinion of the Circuit Court of Appeals is reported in 43 Fed. (2d) 898, and may be found at pages 679 to 690 of the Record.

The opinion of the District Court is reported in 37 Fed. (2d) 385, and printed at pages 555 to 570 of the Record.

Points Advanced by Petitioner for Allowance of the Writ and Now Presented for the Court's Consideration.

1. That the Seventh Circuit Court of Appeals held the patent in suit void, in conflict with decisions of the Second and Sixth Circuit Courts of Appeals, holding it valid over the same defences presented here.

2. That the Seventh Circuit Court of Appeals held the patent not infringed as to some of respondent's constructions; which, in the respect relied upon were the same as those held to infringe in the Second Circuit.

3. That the lower Court was wrong as to validity and infringement.

The Gans Patent was Sustained in Prior Litigation by the Courts of Appeals of the Second and Sixth Circuits.

Prior to bringing this suit against the Graver Corporation, your petitioner brought several suits on this patent in the District Courts of the Second and Sixth Circuits and

claims 1 and 5 here in suit have been sustained by the Courts in those Circuits.

In a suit brought against the Harvey Laundry & Refinite Company in the Western District of New York, Judge Hazel held claims 1 and 5 to be valid and infringed (274 Fed. 937). This decision was affirmed by the Circuit Court of Appeals for the Second Circuit (279 Fed. 713). The Court of Appeals thereafter denied a petition for rehearing filed by defendants in that case (not reported) and likewise this Honorable Court denied a petition for certiorari (259 U. S. 588).

The Gans patent was again sustained by Judge Learned Hand (S. D. N. Y.) on a Motion for Preliminary Injunction in a suit against Paige & Jones Chemical Company (292 Fed. 239). No appeal was taken from this order. Thereafter a second motion was made in the same District Court against the Paige & Jones Company, directed to a changed type of construction. Judge Knox sustained the validity of claims 1 and 5 in suit and granted the injunction. The opinion is not reported. On appeal, the Court of Appeals for the Second Circuit again affirmed the validity and scope of the Gans patent and modified the order of the District Court only to the extent of sending the question of infringement as to certain types of water softener back to the District Court for final hearing (22 Fed. [2d] 916). The suit did not go to final hearing, for the defendant took a license under the Gans patent (R. 156).

In a suit against Frank L. Wadham *et al.* (294 Fed. 370) —Eastern District Michigan—Judge Tuttle declined to follow previous adjudications and held claims 1 and 5 of the patent invalid. The Court of Appeals for the Sixth Circuit reversed the District Court (13 Fed. [2d] 454) and sustained the claims.

Claims 1 and 5 of the Gans patent therefore come before this Court with their validity upheld by decisions of the Circuit Courts of Appeals for the Second and Sixth Circuits and by Judge Learned Hand, Judge Hazel and Judge Knox,

at Circuit; while the Circuit Court of Appeals for the Seventh Circuit in the instant case holds a contrary view.

As your petitioner shall show, there was no defense before the Court below having any bearing on the validity of the patent which had not been already considered and overruled by the Courts of the other Circuits.

Conflict of Decisions and the Errors of the Court of Appeals for the Seventh Circuit.

The conflict of decisions does not arise out of any difference in the records for there is only one item of art brought forward in the present case which was not before the Courts of the other Circuits. That one item, an article by one Weiss in the German language, is clearly irrelevant as a matter of law—which we shall show. Quite properly it seems to have been disregarded, as it is not mentioned in the opinion of the Court.

The conflict may properly be said to have arisen rather because the Court of Appeals for the Seventh Circuit read the prior art in the light of the knowledge of today—years after Gans had disclosed, for the first time, a completely operative zeolite water softener—interpreting ambiguous German publications and reorganizing otherwise inoperative structures with the increments of knowledge contributed by the inventor of the patent in suit. The law is unchallenged that the prior art must be regarded as it was taken at the time—not as it appears to those educated by twenty years' experience with Gans' achievement.

The principal points decided by the Circuit Court of Appeals for the Seventh Circuit in the case at bar were, that the Gans patent did not cover the novel feature of an unconfined bed of zeolite and that in any case such feature had been anticipated by an article (R. 349-453) in the German language published by Gans on April 15, 1909. It was principally upon these two grounds that the Court reached its conclusion that the patent was invalid (R. 679).

The first of these questions was presented and considered by the Circuit Court of Appeals for the Second Circuit and the Circuit Court of Appeals for the Sixth Circuit and both of those Courts held that the Gans patent did cover the novel feature of an unconfined bed of zeolite; as to the second point, Judge Learned Hand in New York and the Sixth Circuit Court of Appeals both held that the patent was not barred by the publication of the above mentioned article by Gans more than two years before application filed.

The question whether the Gans patent covered the novel apparatus which included the feature of an unconfined bed of zeolite is, of course, one of interpreting the patent.

The question as to whether this disclosure had been made in Gans' article, depends primarily upon the meaning of this article published in the German language. In the cases, the opposing parties relied, each upon its own translations, and upon the testimony of translators skilled in German. This whole body of evidence was introduced here by stipulation from the records of the former trials. According to one of these groups of translators, it was perfectly clear that the novel feature in question was not disclosed by the article and consequently the patent in suit was not barred by two years' prior publication. According to the other translation, which was adopted by the lower Courts in the case at bar and is incorporated in the opinion of the Circuit Court of Appeals, there is at least serious doubt as to whether this novel feature was disclosed sufficiently to amount to a full, clear and exact description; for the District Court argued extensively from circumstances *outside the document* itself to support his acceptance of respondent's translation (R. 558-60); and the Court of Appeals adopted that position without restatement (R. 687, top). The other courts took the view that the *doubt* as to the meaning of the article published in the German language and its inherent *ambiguity,* were sufficient to prevent that article from being treated as a disclosure of the invention irrespective of which of the two translations might now be considered to be correct.

It is well settled that in a suit of this character brought in equity, the Appellate Court has power to review the questions of fact as well as questions of law and that this Court will consider independently any questions of fact with respect to which there was a conflict between the Circuit Courts of Appeals.

Concrete Appliances Co. v. *Gomery,* 269 U. S. 177; *Thomson Spot Welder Co.* v. *Ford Motor Co.,* 265 U. S. 445.

It thus appears that there are conflicts between the decision of the Circuit Court of Appeals in the case at bar and those of the Circuit Courts of Appeals for the Second and Sixth Circuits with respect to the decisive questions of law and questions of fact, all of which are open to review in this Court.

The petitioner claims that the Circuit Court of Appeals erred in the case at bar in holding (a) that the Gans invention was not properly disclosed and claimed in the patent in suit, and (b) that the subject matter of the Gans patent did not constitute an invention and was anticipated by the prior art, (c) and that certain of defendant's structures did not infringe.

These are the precise points upon which the Court below differed from the Courts of the Second and Sixth Circuits.

The Gans Patent in Suit.

The Gans patent in suit, No. 1,195,923 (R. 584) relates to zeolite water softeners.

Prior to the introduction of the apparatus of the patent in suit there were only two known ways (commercially or industrially) of removing the hardness from water,[1] distillation and precipitation.

[1] Water is hard because it contains the salts of lime and magnesium. The most common indication of hardness in water is that it is difficult to get suds with soap.

Distillation of water is very expensive and impractical on a commercial scale (R. 282) but it was the only known way of securing a completely soft water, or one of "zero" hardness as it is known in this art. The precipitation process works on the theory that by the addition of other chemicals to the water, such as calcium (R. 282), the hardening constituents in solution in the water are changed to an insoluble form and are precipitated from the water and settled down in the tank. It was well recognized that the precipitation tank was unsatisfactory because of its enormous size (Pl. Ex. 12; R. 309), the skill required for its operation and its very limited capacity. It will not produce "zero" (*i. e.*, completely soft) water, and the excess of the added chemical in the water is objectionable and dangerous (R. 286).

Gans displaced both of these. He invented an apparatus which was small in size and simple in construction; it delivers completely soft water and is capable of continuous use with the minimum of care or skill required for its operation. The testimony stipulated from the earlier litigation (R. 279-309) shows that the Gans' apparatus was the only one capable of commercially softening water to zero hardness up to the year 1919, and nothing even at the present day has displaced it (R. 23). The zeolite water softeners of the Gans patent have been of particular benefit to certain industries requiring soft water, which had previously been restricted to localities where there is such in a state of nature. This is particularly true of the Rayon industry which has been freed from its geographical restrictions (R. 23).

The softeners of the patent produce a water which is completely free from hardening constituents and this is accomplished by passing the hard water through a mineral known as zeolites.[1] This substance has the property of changing its chemical composition by exchange and re-exchange of bases. For example, when hard water is passed through zeolites having a sodium base they will give up their sodium to the

[1] The words "permutit" and "zeolites" are both used to designate the same thing, in the record.

water and take, as a new base, the lime and magnesium of the water. This "softens" the water. After the zeolites have become exhausted they may be regenerated by passing a sodium solution (common salt) through them and thus they give up their new base of lime and take back their original sodium base. The bed must then be thoroughly cleansed of all salt solution. Under this treatment, the zeolites last, and retain their desirable properties, practically always.

Prior to the patent, the chemical attributes of zeolites and their effect upon hard water had been long known, and many efforts to create an efficient mechanism had been tried, but none was commercially successful.

The apparatus of the patent is simple but involves the recognition of problems which were not solved by any prior device.

The patent contains a complete disclosure of apparatus which consists of a cylindrical container having a perforated plate near the bottom upon which rests a layer of gravel. The gravel supports the bed of zeolites, and an important feature is that the zeolites be not confined at the top, but have sufficient space into which to rise or boil when there is an upward flow of water through the apparatus. Zeolites act by chemical action. To utilize this property they must be kept clean and the water must flow uniformly through the entire bed, so as to make the exchange process rapid and thorough, and to utilize all the zeolites uniformly. Zeolite water softeners are thus distinguished from the well known water filter in that the former involve a chemical action necessitating clean zeolites and uniform flow through the bed while the latter is a simple mechanical action and will continue to operate when the filtering material is slime coated; indeed the water filter *requires* this seasoning or aging by accumulated dirt before it operates efficiently.

Complete piping connections are shown in Figures 1 and 3 of the patent (R. 584), so that the hard water may be run into the casing through the zeolite bed and out to the soft water service line. That is the regular service flow for

water softening. But for the equally essential regenerating flow of brine—to put the spent zeolites back to active condition, mechanism was also provided, for cutting off the hard water that is to be treated and introducing a flow of salt water. Then, when the zeolites are rejuvenated, the contaminated brine must be completely washed out of the container—else the customer would get salt water, instead of fresh: which would be both undesirable in every case and deleterious in many—*e. g.*, for use in steam boilers. Means are also provided for washing out any accumulated dirt—this consists of the necessary piping and the free bed. The patented structure provides means for all these flows.

It is immaterial whether the softener be used as an "upflow" or "downflow" softener as both uses are within the disclosure of the patent. This means that the water-softening flow may be in an upward direction—in at the bottom and out at the top—or contrariwise. Claim 1 is limited by disclaimer (R. 587) to downflow softeners, but Claim 5 is not so limited.

The *free* zeolite bed of the Gans apparatus is a necessary feature of all successful water softeners, as is abundantly shown by the record. This means that the bed shall not be held down by a plate or layer, but free to bubble up and rearrange its particles when water passes upwardly through it, either in the softening, the regenerating, or the washing operation. The drawings of the patent (Fig. 1, at *f*, with a free space above, R. 584) so disclosed it. This is likewise a feature which distinguishes Gans from the prior art and is of great consequence, as the Courts have held in construing it. The lower court is in error in regard to the interpretation of the Gans disclosure and claims and is directly in conflict with the opinions of the other courts.

> "To ascertain from experience the need of a free surface to the bed was a genuine invention, even if everything else in the machine had been disclosed before." (292 Fed. 239, 240)—*Permutit* v. *Paige-Jones Case*—C. C. A. 2.

The prior art always shows locking means for the zeolite bed and therefore, as we shall show, can not be read upon the patent in suit, it does not anticipate nor negative invention. The defendant does not follow the prior art but, like the Gans patent, has a free and unconfined zeolite bed.

Westinghouse v. *Boyden,* 170 U. S. 537.

The omission of the locking means of the earlier art was an essential feature of the new combination for it was that locking element which *prevented* the operation of those softeners. The combination *without* the locking means of the prior art, is the invention.

Lawther v. *Hamilton,* 124 U. S. 1, 6.
Hardinge Bros., Inc. v. *Marr Oil Heat Mach. Corp.,* 27 Fed. [2d] 779; C. C. A. 7.

It is also important that proper provision be made for the regenerative flow of the salt solution and the spent brine be completely removed from the casing before the next softening run. There must be no traps or pockets in which the contaminated brine may lodge. This feature likewise is disclosed in the patent and is absent from the disclosure of the prior art.

> "Such a process calls for chemical actions and reactions, as distinguished from the mechanical work of the ordinary water filter, thereby involving chemical problems which the most competent experts do not foresee, but in which apparently small steps turn out to be vital, as, for example, the necessity of draining the salt water from the very bottom instead of from a more convenient point a little higher. None of the experts seemed to know that even a little salt water remaining would interfere with the efficiency of the process." (*Permutit* v. *Wadham,* 13 Fed. [2d] 454, 456—C. C. A. 6.)

Historical Aspect of the Gans Invention.

Dr. Gans, like other scientists, had long known of the properties of the natural zeolites and early in 1907 filed application for the manufacture of artificial zeolites (R.

631), but at that time he and his associates were unable to devise an apparatus (R. 174) in which to use zeolites for the softening of water.

The position and standing of Dr. Gans in the technical world of Germany are amply attested by his achievements and the references to his work found in the publications in evidence in this case.

Gans was familiar at an early date with the sand filter art, as Kriegsheim shows (R. 174, near middle). A number of examples of these filters as depicted by the patents (as early as 1892) offered by respondent are in this case (R. 590-630). The apparatus of these patents was at hand, but they did not aid Gans in finding the solution of the water softening problems. The action of the two types of apparatus must necessarily be very different and the earlier mechanical water filters are totally unsuited for carrying out the chemical process of zeolite water softening. Not one of the filter patents could even *now* in the light of the teachings of the Gans patent in suit, be used for the softening of water without entire *reorganization* of their structures. The Patent Office had these patents before it when the claims in suit were allowed; and likewise the Courts in the subsequent litigation considered and rejected them as references, properly holding that they did not show or describe any apparatus which could detract from the novelty or invention of the Gans patent. Even the Court below simply mentions, without applying, them (R. 687, bottom).

Prior to 1907 there was no art relating to zeolite water softening, so that Gans had to devise a mechanical appliance suitable for the various functions of softening, regenerating and final cleansing. The history of this development is particularly interesting and enlightening, for each step in the unsuccessful attempts to solve the problem is marked by some one of the items of the prior art which defendant in this case—just as the defendants in the other suits on the Gans patent had done before—now asserts is an anticipation of the Gans patent.

Zeolite grains are lighter than the sand and gravel used in filters so it was early found that in flowing the water upwardly through the bed (whether in the softening operation or in rinsing operation), the light grains would boil up and be washed out through the upper flow pipe. Quite naturally, Gans and his associates wished to preserve this expensive mineral, so they did the obvious thing and put a cover down on the zeolite bed and tightly confined the grains. As we shall see, this was the purpose of the various forms of confining means found in all the prior art, for example, the cover plate and burlap and excelsior of the Technische Rundschau softener (*infra*, p. 21) the metal screens of the Leister patent (*infra*, p. 30) and the layer of sand referred to in Gans' own article of 1909 (*infra*, p. 34), this latter article specifically states (R. 450) that the arrangement is "intended to prevent the permutits, which have a lower specific gravity, from being mechanically washed away in case of back washes."

Confining the zeolite bed did prevent the escape of the zeolites, but Gans found that the apparatus was not operative to completely soften water, its action was erratic and very soon ceased to give soft water at all. This was the condition of things when Kriegsheim, later president of petitioner and himself a skilled engineer long identified with the manufacture of sand filters, reading of Gans' work, went to see him in Germany. He learned that the Riedel Company (R. 174) had cooperated with Gans in many attempts to develop a softener, but all had been abandoned as failures. It was not until April, 1908 (R. 184) that Gans discovered the solution of the problem and then in 1909 built and operated in Germany (R. 182) the first successful water softener. This marked the culmination of a long series of experiments by Gans and his associates, as Kriegsheim testified (R. 180, 182-184) without contradiction.

It was discovered that the confining or "locking" of the bed caused the water to flow unevenly through the bed and to form preferred channels of flow, for water will flow along

the path of least resistance. This caused speedy exhaustion of the zeolites contiguous to the channels and the consequent delivery of hard water long before the great mass of zeolite material had passed through its primary stage of exhaustion by absorption of the hardening constituents in the water. That is, the water was not being softened. This result marks one of the great differences between the operation of mechanical water filters and zeolite water softeners. The water filter acts on water containing suspended solids, and its very operation depends on the interception of dirt. The filter bed must be aged by the accumulation of dirt before it commences to operate efficiently, and preferred channels fill up and obstruct the free passage of the water, directing it elsewhere in the bed.

On the contrary, water softeners act on water which has already been cleared of suspended particles of dirt, and perform a chemical action upon the water itself, so it is essential for efficient operation that every particle of water come into intimate contact with the zeolites and flow uniformly through the bed, so that there will not be an uneven exhaustion of the chemical interchange capacity of parts of the zeolite bed.

The problem may seem easy of solution to one regarding it in the year 1930, but the landmarks of failure as typified by the unsuccessful and inoperative devices of the art prior to the Gans invention, are a better test of the difficulties and the skill required for the development of a successful device.

After many experiments, Gans conceived the idea of *omitting* the element from his softener which all the prior art had considered essential. He removed the confining cover from off the top of the bed and "unlocked" it; also providing plenty of "rising space" above the upper surface, so that during the up-flow of the water through the bed, the zeolites would boil up into the rising space.[1] He found that by so doing the preferred channels of flow were broken up and

[1] As shown in the patent drawings, there is nothing above the zeolite bed *f* for a long space, and the upper outlet *l* is almost at the top of the casing (see R. 584).

interrupted during each cycle of operation, and a bed of uniform resistance established. This is not the "aging" or dirt-accumulating process of a water filter.

There was thus evolved the complete, and new, concept of water flow and zeolite efficiency, dependent upon an unlocked bed and a capacity for boiling and the rearrangement of grains in stratified layers, whenever there is an upward course of water through the casing which must be *either* in softening or in regenerating with brine, or final washing out of the brine or in washing out dirt which unavoidably may have accumulated in the bed irrespective of the fact that clean water has been used, before softening re-commences.

As we shall demonstrate, there is nowhere in the art any instance where a uniform flow is secured by this novel method of unlocking the zeolite bed, agitating the grains and providing for this automatic rearrangement. This, with the mechanical parts involved, was the Gans contribution to the water softening art, without which commercial water softening with zeolites would have been definitely impractical and uncommercial.

The Courts of the Second and Sixth Circuits Characterized the Invention as of the Highest Order and Recognized that it Created a New Industry.

It can rightly be said that the Gans patent created the industry of softening water.

The Court of Appeals of the Second Circuit found:

> "By the use of the apparatus in suit, for the first time, zero[1] water has been produced. Theretofore, in the art,

[1] These devices have to remain in service indefinitely. The only attention given them is, to test the effluent to ascertain if it is soft. When a trace of hardness appears, the normal operation is stopped, dirt which may have accumulated in the bed is removed by upward washing, the brine or regenerating solution is passed through, and then rinsing follows

water softening consisted solely of the use of a precipitation apparatus which did not produce soft water. Men deeply interested in the art have been turning their inventive minds toward this problem for half a century. The appellee was the first to produce the result."

* * * * * *

"This invention has been used by power plants, laundries, tanneries, canneries, and various other manufacturers. It is a great advance in the art of softening water. Its savings to manufacturers has been enormous. It is a new and widely used apparatus in a useful art. It is that class of inventive thought which it was the intention of Congress to protect as a valuable contribution to a useful art. The inventor is entitled to his reward, and the appellee to its protection." (*Permutit v. Harvey Laundry Co. et al.*, 279 Fed. 713, 716, 721.)

The Court of Appeals for the Sixth Circuit likewise recognized that the patent in suit created the new industry.

"The process has gone into enormous use in this country, and rarely is there a case where a new art and industry are founded solely upon, and grow entirely from, a patent, so clearly as in this case. It is not claimed that there was ever any practice of the process by any one in the United States before the Gans application, and it is not to be denied that the entire commercial activities of all makers in this country have grown out of the commercial exploitation here by the owners of the patent." (*Permutit Co. v. Wadham et al.*, 13 Fed. (2d) 454, at p. 455.)

The importance and extent of the manufacture of zeolite water softeners under the Gans patent in suit was shown by the history of the introduction of the device into this country and The Permutit Company's business since 1913 (R. 23; 279-309) and was emphasized by the fact that respondent called a number of witnesses to testify in regard

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to remove the last traces of brine. Whereupon the normal function of the apparatus is resumed. It is this ability, with a single device, to produce completely soft water, or to restore at once such ability, which is characterized by the Courts as the production of "zero" water.

to some of the water softeners in commercial use at the present time. It is significant that all of these softeners, with the exception of one, were manufactured under license under the Gans patent in suit (R. 151, 156, 187, 193).

There is no testimony in the present case which in any way controverts the finding of the Courts of the Second and Sixth Circuits that the Gans patent created the industry of softening water commercially. The evidence before these Courts was stipulated here, and respondent made no attempt to controvert Gans' commercial primacy. No one has found a means different from that disclosed by Gans in the patent in suit for the industrial application of zeolites for softening water.

So the patent stands as one for a primary improvement, and thus fulfills the Constitutional purpose of securing a monopoly for that which has "promoted the useful arts".

Respondent's Prior Art Defenses are the Same as Those which were Before the Courts of the Second and Sixth Circuits.

All of the alleged anticipations, with the exception of the Weiss article, which can not be an anticipation,[1] have been before the other Courts which have sustained the Gans patent in suit. Most of these items are foreign patents and publications and each one of them can be distinguished from the invention of the patent in suit.

Not a single one of these items show any device which was completely operative *or had any use whatsoever* in this country.

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[1] This article represents a discussion of Gans' own work on removal of manganese from water and not a water softening device, and was published less than two years before application was filed. Therefore, if germane to the discussion, it tends only to take back the inventor's date (see below pp. 33-34).

The requirements which the law imposes on foreign patents and publications have long been settled.

Seymour v. *Osborne,* 11 Wall. 516, 555.

Judge Hazel in the *Harvey Laundry* case (274 Fed. 937, 940), after reviewing the law, said:

> "Such being the law, the assertion that the prior patents and foreign publications disclose the Gans patent in suit requires careful scrutiny of the evidence in support thereof. Did the prior publications and lectures teach the skilled in the art *how to continuously produce absolutely soft water*—that is, water of zero hardness—by flowing water through a zeolite bed contained in a filter device, or in any known container available to the public?" (Italics ours.)

Judge Hazel answered this question by sustaining the Gans patent. The Court of Appeals in affirming Judge Hazel said (279 Fed. 713, 718):

> "So, also, an invention, patented here, will not be defeated by a prior foreign patent, unless its descriptions and drawings contain or exhibit a substantial representation of the patented invention in full, clear, and exact terms, so as to enable a person skilled in the art or science to which it appertains, *without the necessity of making experiments,* to practice the invention. *Seymour* v. *Osborne,* 11 Wall. 516, 20 L. Ed. 33; *Gen. El. Co.* v. *Hoskins,* 224 Fed. 464, 140 C. C. A. 150." (Italics ours.)

In the early suits on the Gans patent there are many references to a free bed and a "locked bed." From the decisions in these cases it is clear that the matters of defense, regarding the prior structures, were presented in much the same way as they are presented in the present case. In the *Detroit* case (against Wadhams), the defendants placed their principal reliance on a device constructed in alleged similarity to the disclosure of the *Leister* prior patent (R. 653); it was clear to the Court of Appeals (13 Fed. [2d] 454, 457, 458) that the Leister patent disclosed a "locked bed" and that that device did not anticipate the patent in suit.

In the present case we have a device constructed in alleged accordance with the disclosure of the Rundschau article (R. 465); this Rundschau article had been before the Courts of Appeals for the Second and Sixth Circuits and was recognized to show the inoperative locked bed. Consideration of the test device made by respondent in 1929 (*infra*, p. 21) demonstrated at Hawthorne, New Jersey (Ex. 19) will, we believe, show that it departs both in structure and operation in material respects from the disclosure of the Rundschau article. The chief departure is that it did not use a "locked bed".

A bed on the upper surface of which rests a layer of sand or excelsior and which is held against the bed by a screen or cover plate so as to prevent lifting and grain rearrangement is one form of a "locked bed". Respondent's attorney and Moses call such a bed a completely locked bed—"locked as the Feldhoff (publication), completely locked" (R. 112; Def. Ex. 32, R. 477) and refer to an "unlocked bed" as one with a free upper surface above which, at some distance, is arranged a layer of sand or excelsior.

Thus by the respondent's own statement it is shown that the German Feldhoff publication (Def. Ex. 32, R. 477) which dealt with one of Gans' early experiments can not be an anticipation of the patent in suit for it is admitted to show a "completely locked" bed.

Why shall devices which respondent's attorney so clearly distinguish from the references relied upon, be considered devices which are disclosed by such references? The fact is that any bed which permits grain rearrangement, is a free bed; but that is not what the prior art references disclose. It is also a fact (R. 182, 184) that all of the early experiments of Gans and his associates were with locked beds, and all the prior art references are directed to such work of Gans and his associates; he tried them and they failed; subsequently, he hit upon the unlocked bed. The omission of the locking was the "last step that wins". It made success.

In the down-flow softener, the free bed gives a uniform

surface resistance, utilized in giving a uniform distribution of down-flowing water to be softened; in the up-flow softener this gives a uniform surface resistance, utilized in giving a uniform distribution of down-flowing brine and rinsing water. As stated above, the free bed is necessary to permit the washing out of dirt and slime which accumulates in the bed even when filtered water is used.

Respondent made continuous efforts, by statement of counsel and attempted proofs, to establish as a fact that water softeners having *locked beds* were completely operative and that there were many such softeners in commercial use. Respondent's proofs, however, did not show a single instance of a commercial softener with a locked bed—all commercial softeners have, and *must have,* a free space above the zeolite bed.

The proofs show that locked beds (or completely locked beds, as respondent now calls them) were entirely abandoned as inoperative, on the advent of the Gans invention, and that *all zeolite water softeners require a rising space for successful operation,* as demonstrated by the cross-examination of respondent's witnesses on sur-rebuttal.

Moses (respondent's technical expert) testified (R. 187) in regard to a softener at Maywood, Illinois, and offered a sketch of it (Def. Ex. 6?; R. 553). It is significant that Moses admitted that there was a free space above the zeolites of "from one-half to one inch" and that the manufacturer of this softener, International Filter Company, is a licensee under the Gans patent (R. 187).

Respondent's witness, Fritz (R. 190), said that he knew of a zeolite water softener which had a screen *down tight* on top of the bed of zeolites but he gave no further testimony about this and his later testimony related to a softener with sand strainers at the top and which was *not completely filled with zeolites.* It appears that the zeolites were put in through a manhole at the top of the softener and in a dry condition, and that the volume of the zeolites grows less when they are wet in use; so that there would be *free space*

above the zeolite bed, the witness admitting "a little over an inch space at the top head" (R. 193).

Eisenhauer was called as a witness for respondent to testify as to a small household softener made by The Duro Company (Def. Ex. 67). The witness admitted a free space above the zeolites of one and one-half to two inches (R. 195) and that

"* * * it is *designed* to have free space."

He tried to make it appear that the free space was not of much importance, saying:

"We don't pay a lot of attention to it."

The witness had to admit, that the Company shipped the softener with the zeolites in place and *that the very last thing that it did before shipping was to measure the free space with a gauge.* In answer to the Court's question (R. 195), after having previously stated a *lesser* distance, the witness finally admitted a free space above the zeolites of two and a quarter inches.

This Duro softener was likewise manufactured under license of the patent in suit.

Moses (R. 112) said that he had *experimented* with a device with a locked bed with good results; there is absolutely no corroboration of this statement and indeed corroboration as to "experiments" would not assist respondent in establishing that a softener with a locked bed would operate with satisfactory results for "continuous use" in softening water. It is conceivable that the locking of the zeolite bed would not prevent the softening of water through a short space of time, but channelling would soon ensue, and this destroys the *commercial utility* of the device (R. 55, 171-172).

Thus respondent's proofs did not show that "a bed that is locked is not inoperative" [1] (R. 186) but rather, showed,

[1] It was in an attempt to prove this point that respondent asked for and obtained, permission from the trial Judge to take *sur-rebuttal* proofs, with the results indicated on the preceding pages.

that all commercial softeners actually have free space above the zeolite bed, in accordance with the teachings of the Gans patent.

The respondent offered in evidence two Gebrauchsmuster (Def. Ex. 28, R. 664 and Ex. 30, R. 660); they are not printed publications and do not show, describe or claim the invention of the Gans patent. They need not be discussed here in detail for the lower Court agreed with the other Courts of Appeal in rejecting them as references (R. 688).

We have already shown that the Alter patents (R. 580-630) do not anticipate or negative invention in Gans and will now turn to the other matters of defense principally relied upon by respondent.

The Technische Rundschau Article, January 27, 1909, Discloses a Locked Bed and Does Not Anticipate the Patent in Suit.

The article published in the German language in a newspaper, Technische Rundschau, on January 27, 1909 (Def. Ex. 24, R. 461) does not anticipate the Gans patent. It discloses only an inoperative structure and was properly rejected by the Courts of Appeals for the Second and Sixth Circuits.

The Court of Appeals seems to dismiss this from serious consideration. It says (R. 687, ⅓ down): "Witnesses on the trial could not agree as to whether the article showed the zeolites to be in a locked bed or unconfined".

Such doubt is, of itself, sufficient to dispose of the reference and shows no difference with the other courts. But respondent puts its main reliance, apparently, upon this reference, and hence it may well be considered further.

The bed of zeolites is confined by a layer of excelsior and held down by a perforated cover over which canvas is stretched.

Prior to the trial, respondent demonstrated a device in a laundry at Hawthorne, New Jersey (Def. Ex. 19) which its technical men designed and built in 1929 for the purposes of this case. Apparently realizing that the device of the Rundschau article was not a disclosure of the Gans invention and was not operative, respondent freely made changes and departures from the disclosure in its test device and then tried to justify them by assertions that they were within the "skill of the calling". No one who testified about this device on defendant's behalf had any knowledge of the subject in 1911 or before, as we are about to show.

The District Court failed to appreciate that the departures from the publication were significant (R. 566, top), and attributed to those who preceded Gans all the knowledge acquired by years of familiarity with the art built upon his achievement at the time when Gans made his invention.

Rundschau, like other items of the prior art, had a locked bed—that prevents the successful operation of a zeolite water softener. The Graver engineers in making the Hawthorne device discarded the locked bed of Rundschau and adapted the free and unconfined zeolite bed of the Gans patent in suit (Pl. Ex. I, R. 345; R. 158-159).

It is important to ask who are these n[illegible] who made the Hawthorne test device and where did th[illegible] their knowledge of the art of water softening?

Dr. Moses (R. 118), the designer of the [illegible]thorne device was fourteen years old (R. 90) when Gans made his invention and had his first introduction to zeolite water softeners in 1921, five years after the Gans patent in suit had issued. Prior to 1921 he had never even seen a water softener and the first one that he did see (R. 118) was held by the Circuit Court of Appeals for the Second Circuit to be covered by the Gans patent. Riley, the operator of the device, was technically trained like Dr. Moses (R. 134) and had his introduction to zeolite water softeners even later; he did not even graduate from college until 1924 and was only six years old (R. 133) when Gans first solved the problem of a suc-

cessful zeolite water softener. Both came into this art after the Gans invention had obtained the great commercial vogue noted by the Courts in the previous decisions.

It may be easy enough *now* for Moses and Riley, with wisdom acquired from the commercial industry which Gans founded, to take the disclosure of the Rundschau article and construct a Hawthorne device, with just the changes here and there which are *necessary* to make it operate satisfactorily, and secure results which were for the first time secured by Gans after he and his associates had worked on the problem for years. They had to abandon the earlier attempts—like the device of the Rundschau article—as failures. The pioneers found the solution of the problem only after hard work in the laboratory and with full sized apparatus and it took months of effort for Gans to discover and avoid the final obstacles to success (R. 182-184)—all that was twenty years ago.

The respondent's experts of today say they find no problems in the construction of zeolite water softeners; fortunately for pioneer inventors, like Gans, such knowledge cannot defeat this meritorious invention. This Court has always been zealous in discriminating *later acquired* knowledge from that current at the *critical period.*

U. S. v. *Am. Bell Telephone Co.,* 167 U. S. 224, 261.

It is particularly significant that the changes and departures from Rundschau were the very ones which Gans had already found were necessary. Indeed, the knowledge of the experts of 1929 is "wisdom born after the event"; they both visualize the prior art from the point of view of the patentee's accomplishment, and regard changes which, historically, turned failure into success as within the expected skill of the calling that did not in fact exist when the Rundschau article was published.

Among the important differences between the Hawthorne structure and the Rundschau publication (R. 156) are the

substitution of a free space above the zeolites for the inoperative locked bed of Rundschau and various departures adopted for the evident purpose of securing a high flow rate of 60 gallons a minute in contrast to the flow of 18 gallons a minute (the rate specified in the article itself).

In the operation of the softener at the test, the salting was done in a manner not justified by any disclosure of the article and the back-washing was carried out in the curious manner of overflowing the sides of the tank. The latter expedient was apparently adopted for the purpose of getting a higher rate of flow than could be carried off by the discharge pipes, so as to suspend the zeolites and thoroughly clean them in the back-washing, *a result which could not have been secured with normal operation and with the piping shown in the drawing of the Rundschau article* (R. 166).

Another departure from the disclosure of the Rundschau publication consists in the holes which defendant placed in the short vertical pipe which supports the cross pipe *c* by which the water is delivered to the softener (R. 160). The evident purpose of the insertion of these holes in the pipe is to endeavor to make it appear that the drawing of the Rundschau article showed *one element* of the combination of claim 5 of the patent, namely,

> "* * * means connected to the lowest point of the casing for removing the salt solution * * *".

Moses stated (R. 130) that he could see such holes in the piping in the photostat copy of the drawing of the Rundschau article itself, but it appears to us that these alleged "holes" are not disclosed in the drawing and certainly they are nowhere mentioned in the text. Respondent placed in evidence a recently prepared enlarged copy of the drawing of the Rundschau article and it is stipulated (Def. Ex. 45, R. 510) that this is on a scale

> "more than three times the size of the cut as it appeared in the original Technische Rundschau article."

Consideration of this enlargement at least casts doubt on whether "holes" were intended as a showing of the drawing of the article (Hammer, R. 160). But it is clear that the original article and the drawing are the only matters which could be used as a disclosure of alleged anticipation of the patent in suit and that magnifying glasses and *recently made enlargements* are not proper. Further, the drawing does not agree with the description and admittedly there is no description of the "holes" in the text of the article, nor is there any statement of any function to be performed by them. These perforations do not discharge any function in the description or operation of the construction, and indeed would interfere with the even distribution of the liquids through the cross pipes in the *intended* operation of the device (the intended flow of water is indicated by arrows, R. 159-160). But even though the Rundschau article did show the "holes", this would not constitute it an anticipation of claim 5. A combination claim cannot be anticipated by showing one element of the combination.

Respondent has described the high rate of flow as a virtue in the Hawthorne device and tried to make it appear (R. 166) that the Rundschau device is a softener which was better than the author of the article suspected. Analysis of the facts has demonstrated that the use of a flow rate of 60 gallons (R. 103), rather than the rate of 18 gallons a minute disclosed by the article, was adopted for a purpose quite different from the asserted one. Moses maintains that the operation of an up-flow softener at the disclosed rate of 18 gallons a minute is a very low flow rate and he says (R. 92):

> "* * * we do not recommend the use of machines under those conditions."

The use of a high flow rate at Hawthorne, *more than three times as great as that which is disclosed,* was used for the purpose of preventing "channeling" (*i. e.,* making passages in the zeolite bed through which the hard water would flow without being softened) and is a recognition of the fact, which

Moses knows and asserts, that at the lower rate of 18 gallons a minute, employed by the prior art, the zeolites will not be lifted, and floating (R. 92).

It is clear why respondent did not follow the 18 gallon flow rate of the Rundschau article (with a locked bed as there disclosed) and why it changed to the 60 gallon rate (with an unlocked bed) *after it admittedly had tried out the lower rate of flow* (R. 135, 142, 160-161). This change necessitated the abandonment of the canvas cover (prescribed in Rundschau) and the substitution of very porous burlap (R. 157), it also made necessary the insertion of a rubber gasket between the cover plate and the metal flange to prevent the escape of the zeolite grains under the influence of the high flow rate. The Rundschau device was never designed to operate at any such flow rate, and to carry off the water the respondent had to add extra piping (R. 161) for the discharge in the softening operation.

Respondent, in building this apparatus was careful *not to confine the zeolite bed* and its experts therefore *provided a support* for the metal plate and burlap instead of letting them rest upon the excelsior, as in the publication (R. 157); naturally this made a substantial difference in operation (R. 161).

By operating the Hawthorne device at the unjustified rate of 60 gallons a minute the slight restraining or confining influence of the excelsior was entirely overcome and it no longer came within Dr. Moses's definition of a "locked bed" (R. 108):

> "I have a definition of a locked bed, with reference to zeolite of course, a locked bed is any bed of zeolite in which a restraining means interferes with the normal expansion of the bed, under the conditions of its normal flow rate."

He also says that in the normal use of an up-flow softener, the bed is in suspension (R. 91) and is being lifted and loosened during the softening run (R. 93); conditions which are not possible if a softener has the confined zeolite bed described in the Rundschau publication.

Moses's definition of a locked bed (R. 108), and his statements cannot be reconciled with his assertion that the Hawthorne device comes within his definition of a locked bed. The fact is that the "normal expansion of the bed" was not restrained in the Hawthorne device; *the bed was not locked* and was thus a departure from the teachings of the Rundschau article.

The Hawthorne device was run on the *softening* operation at the "back-wash" rate[1] (instead of 18 gallons a minute) and the bed bubbled and boiled under the influence of the high flow rate (R. 159, 161) in the free and unconfined space between the bed and the metal plate. It is clear from the Rundschau article that the *follower* plate was intended to *continuously* hold the bed down—a locked bed—and a *stationary* plate supported by a flange with a smattering of excelsior between it and the bed, is not what is disclosed in the article. Comparison between what is *shown* in the Rundschau article and the plate *used* in the Hawthorned device is well illustrated by Mr. Hammer's sketch (Pl. Ex. I, R. 345).

The excelsior was unevenly distributed in the Hawthorne device (R. 158), and was sufficient to fill but a small fraction of the space between the surface of the bed and the *separately supported* cover plate. When levitated by the swift rush of water at the abnormal rate employed, the floating excelsior layer, therefore, left a large portion of the space between this lower surface and the zeolite bed free and open for the boiling of the zeolites. That the zeolites did have free space above them was proved by the testimony of the witnesses (R. 158) that the excelsior and cloth cover fell down when the tank was drained.

Movement of the zeolites would not have occurred had the Hawthorne device been constructed and operated more nearly in accordance with the Rundschau article; the excelsior and the zeolites would have been held down by the follower plate just as they were intended to be in the disclosure of the Rund-

[1] This means, as Waterman explains at R. 54, 73, the rate at which the exhausted bed must be washed to expand and grade it and thoroughly free the zeolites of dirt.

schau article, while in the Hawthorne device the iron plate was held *stationary above* the zeolite bed by an iron flange—clearly not disclosed in the Rundschau article—and the *necessary* free and unconfined space above the zeolites thereby secured.

The teachings of the patent in suit when followed exactly produce an apparatus which has entirely revolutionized the water softening art. It has, in fact, created a "useful" art in the Constitutional sense. To hold that any important feature of the construction of this patent is anticipated by what some expert, years after the issue of the patent, thinks he is free to alter in the newspaper description of a practically inoperative apparatus, would be inequitable and unfair and would defeat the very purpose of the Patent Statute.

We have described the Hawthorne device in somewhat more detail than it may appear to warrant, but we have done this both because of the exaggerated importance attached to it by respondent in this case, and because in each of the suits on the Gans patent the then defendant has taken an item of the prior art and made a model of it, which, by changes in the disclosed structure, tended to bridge over gaps between the disclosure itself and the Gans patent. Here we have the Hawthorne adaptation of the Rundschau article and in the Sixth Circuit case there was the demonstration device asserted to be a replica of the Leister German patent. Judge Denison's remarks regarding the latter likewise aptly characterize the Hawthorne test device because defendant there, with knowledge after the event, also demonstrated a device in which it had unlocked the zeolite bed:

> "The trial below was also distinguished from the former hearings by the presence of a full-sized machine, which defendant's expert said he had built in conformity to the Leister patent, and which worked successfully. This proof had the vices of all such demonstrations in which, *when it is pointed out that the constructor has departed in various respects from the literalness of the earlier patent,* he excuses the departure by saying that in these respects he used only common knowledge. This

is most likely to be the knowledge which seems to him common after he has been for years familiar with the patented invention. In addition to several criticisms made by counsel, *it is to be noticed that this exhibit machine has a free bed of zeolites instead of one confined by a screen on top;* and we have already stated our conclusion that the Leister patent does not authorize this construction." (*Permutit* v. *Wadham et al.*, 13 Fed. [2d] 454 at 457—Italics ours.)

The facts here are legally identical with those in *Carnegie Co.* v. *Cambria Co.*, 185 U. S. 403, 420. There a certain Deighton English patent was produced which, it was alleged, anticipated the Jones Mixer patent in suit. The court said:

"It is insisted, however, that defendants have demonstrated by practical experimentation with a plant constructed according to the specification of the Deighton patent, that the results are practically the same as those obtained by the Jones process. This plant, however, was constructed after suit brought, long after the Deighton patent had been allowed to expire, and with no opportunity afforded the plaintiffs to inspect the plant or witness its operation. The tank was fitted with a cover, and a constant pool of molten metal retained in it; but this was not the Deighton process, but the Jones process adapted to the Deighton device. Were this evidence admissible at all, we are satisfied that it is met by the fact that if the Deighton patent had been adaptable to the Jones process, it is scarcely possible that its merits should have failed to seize upon the attention of manufacturers, who would have brought the patent into general use, instead of allowing it to lapse for the non-payment of a comparatively small fee. As something in the nature of the Jones process was needed to enable steel to be manufactured directly from the product of blast furnaces, the utility of the Deighton patent for that purpose would at once have been recognized and its success assured."

Leister German Patent Discloses a Locked Bed and the Construction was Useless and Inoperative.

The Leister German Patent 211,064 of January 1908, is Defendant's Exhibit No. 34 and the translation Exhibit No. 35 (R. 653). Leister recognizes the fact that there was then no successful apparatus available for the utilization of zeolites for softening water (R. 653):

> "Up to the present, however, there has been a lack of an apparatus which makes possible, in an unobjectionable manner, the useful application, on a large or small scale, of the useful properties of permutits as described above in the purification of water, or the like."

As we shall show, Leister's suggestions, likewise, were useless.

It seems unnecessary to discuss in detail the disclosure of this German patent for it is clear upon the face of the drawings that the device embodies *a locked zeolite bed.* The showing of the drawings and the description in the specification are meager, but the essential features of this apparatus were appreciated by Judge Hand on the Motion for Preliminary Injunction in the *Paige-Jones* case and by the Circuit Court of Appeals for the Sixth Circuit in the *Wadham* case (13 Fed. [2d] at p. 457). These courts appreciated that the Leister apparatus embodied the very feature which spelled failure for the devices of the prior art, namely, the locked bed.

Judge Hand said of this Leister patent:

> "The disclosure nowhere says whether the surface is free or not, and the drawings do not seem to intend free surfaces, because the beds end with straight lines. I should, if necessary, hold that there ought to be clearer indication of this feature if the reference were to be an anticipation; but the internal evidence helps towards the conclusion that there were screens intended.

"Leister disclosed two forms of his invention, one with a single bed, the other with a double. While, as I have said, it is impossible certainly to ascertain whether he meant to have screens over the zeolitic beds, it is difficult to see how the machine could have been operable without them. The regenerating fluid was not intended to pass through the filter, and probably that was the reason for the space or cell. One thing appears certain, as Waterman says, *i. e.*, that the head of the regenerating fluid was greater than that of the back-wash. If the back-wash was in fact enough to 'boil' the zeoliths which is essential to the proper automatic sorting of the particles, then the regenerating fluid would 'boil' them more and they would necessarily pass off in substantial quantity through the waste. The cock, 4, in the first form, and 8 and 9, in the second, are practically at a level with the top of the bed.

"Thus, so far as I can see, I have to choose between an apparatus which would lose the zeoliths, and so be inoperable, and one in which there were screens over the beds, as had been the case in Feldhoff's disclosure. It is clear anyway that even if it can be shown at the hearing that the feature, now become so important, was in fact present in Leister's patent, at least the disclosure as it stands will not serve as an anticipation." (*Permutit* v. *Paige & Jones Chemical Co., Inc.*, 292 Fed. 239, at p. 241.)

As stated, the defendant in the Sixth Circuit case demonstrated what it called a Leister device but departed from the disclosure and demonstrated a zeolite water softener with an *unconfined zeolite bed*—criticising it, the Court there said:

"In addition to several criticisms made by counsel, *it is to be noticed that this exhibit machine has a free bed of zeolites instead of one confined by a screen on top;* and we have already stated our conclusion that the Leister patent does not authorize this construction." (13 Fed. [2d] 454 at 458.)

The Leister German patent is merely another one of the prior art devices which are inoperative because the zeolite

bed is closely confined by screens—it did not and cannot solve the problem which Gans alone solved and disclosed in his patent.

Judge Denison in writing the opinion for the Court of Appeals for the Sixth Circuit disposed of the Leister German patent as a reference to the patent in suit saying:

> "The point most stressed is with reference to the Leister German patent. This was not before the Court of Appeals in New York, but it was before Judge Hand, and we concur in his view of it. Passing all other questions, it might be assumed that the Leister patent disclosed the patented thought, save for one exception. It now conceded that the zeolite bed must be free and unconfined upon its upper surface. The reason is that upon the backwash it must boil, so that the finer and lighter particles will go to the top and will then settle into a relatively imprevious stratum, whereby the water when the softening operation begins will percolate through all parts and will not find free channels. In earlier instances of analogous effort, the zeolite bed had been supported by a screen upon the bottom, and it had been held down from the top either by a screen or by an immediately superposed bed of filter material. It is the claim of defendant that the Leister patent shows a zeolite bed free at the top. In deciding whether it does, the specification does not aid the drawing; and the drawing, which is a vertical cross-section of the whole structure, is in this respect obscure. There is an open space above the zeolite bed. The bottom and top of the zeolite bed are marked by heavy lines. It is conceded that the lower line indicates a supporting screen. Plaintiff says the upper line indicates a holding down screen. Defendant says it merely indicates conventionally the situation at the top of the zeolites. Similar lines above and below the nearby filter bed do indicate screens. Other inferences also are rather persuasive that this line represents a screen; but the very existence of the ambiguity is fatal to the defense. The fact that the Leister patent was soon forfeited for nonpayment of the trifling annual fee is confirmatory evidence that it was not the solution of the problem." (*Permutit* v. *Wadham,* 13 Fed. [2d] 454 at 457.)

The fact of the forfeiture of the Leister German patent for non-payment of taxes, is also proved here (R. 185). It is inconceivable that if it had any value as a solution of the problem which in that period was absorbing so much inventive effort in that country (all the prior patents and publications relating to the zeolite water-softening art were German), it would have been forfeited.

Carnegie Co. v. *Cambria Co.*, 185 U. S. 403, 420.

The Weiss German Article Can Not be an Anticipation of the Gans Patent and has No Significance in This Suit.

The only item of art brought forward at the trial of this suit which had not been before the other courts is a German article by Weiss relating to Gans' own work on *removal of manganese* from water. This Weiss article was published in Germany on June 3, 1910 *less than two years prior to the date of filing of the Gans United States application* (August 5, 1911) and subsequent to the date of the Gans invention.

The date of publication alone would rule out this article as a reference, it cannot anticipate nor be a bar to the United States patent under Section 4886 of the Revised Statutes and has no significance in this case.

> "Sec. 4886. Any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvements thereof, not known or used by others in this country, before his invention or discovery thereof, and not patented or described in any printed publication in this or any foreign country, before his invention or discovery thereof, or more than two years prior to his application, and not in public use or on sale in this country for more than two years prior to his application, unless the same is proved to have been abandoned, may, upon payment of the fees required by law, and other due proceeding had, obtain a patent therefor"—

for it is a publication less than two years prior to the U. S. filing date.

This German article is so clearly irrelevant, as a matter of law, that it seems to have been properly disregarded by the Court of Appeals and attention is called to it here because the opinion below stated that the "record in the instant case is somewhat different from the records presented on the other appeals" (R. 690). This one item of art is the only thing that is new to the record and it cannot be a bar to Gans.

The Translators Disagree as to the Translation of the Gans "Chemische Industrie" Article and it Can Not be an Anticipation of the Invention.

The Court below found that the article in the German language by Gans (R. 513), published in the "Chemische Industrie" on April 15, 1909, constituted an anticipation of the patent in suit. This is directly contrary to the rulings of the other Courts which had already passed on this Gans article, although the evidence (R. 349-453) about it was stipulated into this case *in toto* from the records of the two other cases where the defence was specifically considered and overruled.

The article contains no drawing, and it does not show or describe the invention of the patent in suit, for it does not disclose the free and unconfined zeolite bed which is a necessity for the successful operation of a water softener. As Dr. Luthy (a practical engineer, as well as a German scholar), pointed out (R. 388),

> "* * * in the absence of diagrams or drawings it is hard to define what the meaning of this is".

The testimony before the lower Court in regard to this article is identical with that before the other Courts and consists of translations by some sixteen different translators.

There is a sharp conflict over the translation of some few words in six lines of the long German text, although they all agree that the meaning of *the most important word in that passage, when used in other places in the same article, has the meaning attributed to it by the plaintiff's witnesses in the disputed passage.*

Neither the trial Court nor the Court of Appeals considered this most important fact in construing the excerpt relied upon; but, as shown above (*supra*, p. 5), read the isolated passage in connection with extraneous patents and publications.

The lower Court finds a disclosure of the free zeolite bed in the translation which it adopted, while it is clear that in the other translations there is no suggestion of anything but the old and unsuccessful confined zeolite bed. The translators were all reputable men and the conflict at least shows the ambiguity in the German text; which of course is fatal because the law resolves every reasonable doubt in favor of the patent.

The article cannot be said to be that clear and distinct disclosure which the law requires of a foreign language publication. When such doubt and ambiguity exist, a court should not, years after the event, attempt to resolve the ambiguity and spell out anticipation of the United States patent.

The sharp conflict regarding the translation settles the point against respondent, and so the other courts held:

> "About this clause the learned doctors disagree, and it seems to me quite enough to say that the disagreement is honest without trying to solve it, which would be quite beyond my powers. *To be a valid anticipation greater clarity is necessary, else there is no adequate warrant that the art was enriched.*" (*Permutit* v. *Paige-Jones*, 292 Fed. 239, 241—Italics ours.)

> "Nothing of earlier date in Germany and unpatented there invalidates the patent unless it was a publication; and the rule is firmly established that an earlier foreign

> language publication must be clear and explicit in the extreme." (*Permutit* v. *Wadham, et al,* 13 Fed. (2d) 454, 456—C. C. A. 6.)

Plaintiff's witnesses translate the disputed paragraph as describing a construction in which the sand filter referred to therein lies directly upon the surface of the permutit, *i. e.,* a construction in which the permutit bed is "terminated", "finished off", or "closed off" (Abgeschlossen) by a sand filter which is ⅓ to ½ meter thick. Defendant's witnesses translate the word (Abgeschlossen) as "closed off", but they say that the sand filter which does the closing off is not on the surface of the permutit but is from ⅓ to ½ meter away from it.

Respondent's counsel in offering the translations as exhibits to the trial Court stated (R. 114):

> "Now, the dispute with reference to this particular translation is in one respect and in one respect only, and that is the translation of the last paragraph."

and continuing,

> "I suppose it turns on the interpretation of German word 'hohe', which I think means high."

To this argument of counsel the trial Judge replied:

> "That is what I have always understood."

It so happens that the word "hohe" is used five times in the Gans article and in every instance but this one it is translated by both groups of translators in the sense of *thickness in the vertical direction,* "height" and "depth" (R. 452) in that sense are synonymous. In parsing the disputed paragraph, respondent's translator Mason says "hohe" is synonymous with "height", "altitude", "elevation" (R. 352), *i. e.,* vertical distance between two objects, but when he translates its other occurrences he translates it (Def. Ex. 44) in the sense of thickness or height of a mass in the verticle direction and not in the sense of altitude or verticle distance between two objects.

Indeed it would seem that plaintiff's translation is by far the most reasonable; but speculation is idle for the *ambiguity* makes it impossible to say that the article *could have* enriched the art in the United States—it is certain that it *did not* teach the American public how to make an operative water softener, for they were first introduced into this country in 1911 by The Permutit Companies under the patent in suit—not developed here previously from the disclosure of the 1909 article here under consideration.

The Court below thinks Gans should have been called as a witness to *explain* his German article. Aside from the fact that it is nowhere shown that Gans would be available to plaintiff to come to this country to testify, the remark of the Court is improper as a matter of law. The relevancy of the Gans article cannot be a question of what Gans *intended* to say or what he *had in mind.*

> "If prior patents and publications can be reconstructed by extraneous efforts to fit the exigency of the case, it would, as was said in *Badische Anilin & Soda Fabrik* v. *Kalle & Co.*, 104 Fed. 802, 44 C. C. A. 201, require an inquiry, not only as to what the publication communicates to the public, but 'it will be transferred to an endeavor to ascertain what its author intended to communicate.' We cannot read into this article what is not there, and which it would be necessary to obtain from the later development of the art in order to meet with appellee's success." (*Permutit* v. *Harvey Laundry*, 279 Fed. 713, 719.)
>
> [The *Badische* opinion quoted from was by Judge Lacombe.]

The question simply is what did the German article disclose to the American public *prior to the date of the United States application.* The law in regard to the clarity required of a foreign publication is well established and needs no citation of authority.

It should be borne in mind that respondent is here relying upon a statutory bar to the grant of the patent in suit—*i. e.*, is asserting that, more than two years before he applied here,

the patentee published a disclosure of the same thing. It is an estoppel, or bar, and should be construed strictly against the one invoking it. The publication was not in English, but in a foreign language, requiring translation. It had no picture or drawing, although the patent in suit is of a mechanism requiring drawings. Its English meaning is at least in doubt, on the translators' testimony. But it is significant, as supporting plaintiff's rendition that very shortly after its publication there was an article on Gans' device in the English journal "The Practical Engineer"—offered in evidence by the respondent (R. 471), in which both the *thickness* of the permutit layer is referred to, and it is distinctly stated that that layer is "covered on the top with a loose though dense stratum of finely-spun wood-wool, kept back immediately below the discharge tube by a perforated cover coated with linen" (R. 472)—thus fully supporting plaintiff's position as to the significance of the original; if, as the Courts below assumed, the publication is to be interpreted by other publications.

From the internal evidence of the article itself and the disagreement of the translators, the conclusion must inevitably be that the German article of Gans does not disclose the invention of the patent in suit and cannot be said to constitute a bar to the United States patent. The Courts of the Second and Sixth Circuits were right.

Infringement.

The District Court below said nothing on the subject of infringement.

The Court of Appeals after declaring the claims to be invalid (R. 689) added that, because respondent's "presently used structures", "having their openings near the bottom but not at the lowest point of the casing", they "do not infringe claim 5". In this respect also the decision is at variance with the scope awarded the claim by the decisions of the Circuit Courts of Appeals for the Second and Sixth Circuits; since in

both the *Wadham* case (as shown at R. 493) and the *Paige-Jones* case (as shown at R. 497) the outlets were "near the bottom but not at the lowest point of the casing"; yet both were held to infringe, notwithstanding.

The purpose of locating the outlet "at or near the bottom" is to ensure the removal of all the brine, etc., after regeneration is complete, so that when the device starts to soften hard water again, no salt will come out. In practice, this is as true of all of respondent's devices as of the patent.

Three Graver water softeners are involved: the 1923, 1925 and 1927 types. The 1923 device is shown and described in the Graver bulletins (Pl. Ex. 10; R. 277) and drawing (Pl. Ex. 6; R. 261). Infringement of both claims 1 and 5 was found by the District Court on motion for preliminary injunction, and is not disputed by respondent.

The Graver 1925 softener is shown and described in the Graver bulletin (Pl. Ex. 3; R. 209) and drawing (Pl. Ex. 7; R. 263). It is like the 1923 device except that the distributing manifold and concrete supporting bed at the bottom of the 1923 casing is changed to a perforated strainer plate on which the bed is supported and which forms a basin below the bed into which a pipe extends. Both the 1923 and the 1925 devices were down-flow softeners.

Claims 1 and 5 are Both Infringed by the 1925 Device.

The District Court on motion for preliminary injunction held that the 1925 softener infringed both claims. Respondent's admission as to infringement of Claim 1 by the 1923 softener carries with it a similar admission of infringement of claim 1 by the 1925 softener. However, respondent contests infringement of claim 5 by its 1925 softener on its assertion that this device has no means connected to the *lowest* point of the casing for removing the salt solution. The expression of claim 5 relating to this point is:

> "and means connected to the lowest point of the casing for removing the salt solution so introduced."

It is the salt solution or brine which is passed through the tank after the completion of the softening phase of the cycle of operations which "regenerates" the zeolites and puts them in condition for further softening. After the passage of brine regenerates the zeolites, there is a flow of water through the bed to wash the salty particles out of the bed so there will be no *taste* of salt in the subsequently softened water. The determining test is to *taste* the effluent for saltiness, or to wash for the length of time test has found to be desirable.

Respondent says claim 5 is avoided by not physically attaching the outlet pipe to the uttermost low-point on the casing, but inverting the mouth of the outlet pipe *near* the very bottom of the casing so as to draw out the brine or salty water just as effectually. The patentee's purpose was to provide an outlet at the bottom of the tank for getting rid of any salty water.[1] It is immaterial whether the outlet pipe shall be physically attached to the extreme lower tip of the casing to withdraw the salty water of whether it be physically attached elsewhere but projects downwardly into this discharge space *so as to perform the identical work.* The two expedients afford merely a plumber's alternative, and are equivalent modes of achieving the Gans result of getting rid of the accumulation of brine at the "lowest point" of the casing, after regeneration. The testimony shows that at the Brooklyn test of the Graver softener (performed in the presence of representatives of both parties; stipulations, R. 311 and 325) it was found that within 8 inches of the mouth of the outlet pipe there was an increase in water velocity from 32 feet a minute to 235 feet a minute at the pipe, "which means a tremendous acceleration

[1] The patent says (Rec. 585 near bottom of second column):

> "* * * and allowing the solution of salt after passing through the filter to pass outwardly through outlet *j* at the low point of the bottom and thence escape through the waste valve *p*."

in reaching the pipe * * * which will force everything that is in the neighborhood of the end of that pipe into the pipe" (R. 33). In other words, there cannot be formed any static pool of salty water which may later enter the circulation with softened water. If respondent's devices permitted salt water to travel with soft water into the home or factory it would be uncommercial; no one would buy such a softener. It does not seem necessary to discuss in detail the Brooklyn test of the Graver softener, as the proofs show definitely how free of saltiness was the soft-water effluent of that device (R. 32). The commercial test of saltiness is conclusive on this score.

Claim 5 is Infringed by the Graver 1927 Upflow Softener.

This device is shown and described in the Graver bulletin (Pl. Ex. 4; R. 222) and drawing (Pl. Ex. 8; R. 265). It is the same in construction as the 1925 down-flow softener except that the pipe connections and valves are altered so as to reverse the direction of the flow of water in softening, although not altering the direction of flow in regenerating and washing.

The respondent urges non-infringement of claim 5 by the Graver 1927 up-flow softener on three grounds: (1) that the disclaimer as to claim 1 also limits claim 5 to a down-flow softener; (2) that the Graver 1927 up-flow softener has not the filter bed of claim 5; and (3) that the up-flow Graver 1927 softener has no means for removing the spent salt solution (regenerating brine) from the bottom of the casing. As to these:

(1) *The disclaimer in the Gans patent does not limit claim 5 to a down-flow softener.*

It seems unnecessary to say more than that the disclaimer is specific in its terms and that it refers only to claim 1 of the Gans patent, the disclaimer specifically being "hereby disclaims from the scope of claim 1 of patent 1,195,923 any water softening apparatus, etc."

We know of no authority for extending a disclaimer beyond its exact terms and the patentee had a right to restrict claim 1, leaving the other claims unrestricted. As each claim is, in effect, a separate patent, there is no basis for the argument that disclaimer as to one claim in any way affects the scope of the remaining claims. (*Leeds Catlin* v. *Victor Talking Machine Co.*, 213 U. S. 301). The Court of Appeals for the Second Circuit considered this question in the *Paige & Jones* case (22 Fed. [2d] 916, 918):

> "This, however, does not extend to claim 5. We may not so construe it. *Permutit* v. *Harvey, supra; Permutit* v. *Wadham* (C. C. A.) 15 F. (2d) 20."

The Court of Appeals of the Second Circuit in citing the Wadham opinion, clearly shows that it understood the opinion of the Sixth Circuit to mean that the disclaimer did not affect claim 5.

Judge Knox, in the same case below (not reported) said:

> "Two Circuit Courts of Appeal have upheld the validity of Claim 5 of the patent in suit. Each of them has expressed belief that the invention represents a valuable contribution to the useful arts. Neither of them, in terms at least, placed any limitation upon a scope of Claim 5 as a result of the patentee's disclaimer, which excluded from the scope of Claim 1 an apparatus in which the water to be softened passes upwardly through the layer of zeolite. This Court, therefore, should refrain, I think, from imposing the limitation that defendant argues should be placed upon Claim 5. In consequence, I shall assume the validity of the claim as it is written in the patent."

(2) *"Filter Bed."*

Respondent insists that the term "filter bed" called for by claim 5, necessarily means a bed by which foreign matter in the water is strained out; that a zeolite bed can only act to strain out foreign matter in down-flow softeners, and that the Graver 1927 softener has no such straining function and therefore is not a filter bed within the meaning of claim 5. The contention seems frivolous to us.

The word "filter" in its general and accepted use, has no such restricted meaning as respondent urges, but the word "filter" is used in a broad sense as meaning to percolate or trickle through. Thus one speaks of the coffee filter and of water as filtering through the earth, to the roots of plants, and many similar uses.

Even if the term "filter" be restricted to purifying, the zeolite bed is even in this sense a filter, as it acts to purify the water by removing its hardening elements which constitute the impurities, although this purification is by chemical action instead of by a mechanical separation.

Graver bulletin (Pl. Ex. 4; R. 222) describing this 1927 up-flow softener, also supports this meaning and throughout uses the word "filter" in describing the softener:

> "The Graver zeolite water softener is of the pressure *filter* type." (Italics ours—p. 4.)
>
> "In horizontal *filters* the strainer plate * * * The ends of the beams are bolted to angle irons which are riveted to the *filter* shell." (Italics ours—p. 6.)
>
> "The Graver Valve Nest allows the use of these as well as any other methods ordinarily encountered in *filter* operations." (Italics ours—pp. 7, 8.)
>
> "Cast iron legs are furnished with all vertical *filters*." (Italics ours—p. 8.)

Moreover, the Gans patent in suit makes clear that it does not consider the zeolites (*f*) as filtering material in the sense of removing suspended matter, as the patent shows a separate filtering material (*e*) for mechanical separation above the zeolite bed and repeatedly distinguishes between such filtering material and the zeolites (patent p. 1, line 60; R. 585).

The argument of respondent is that the zeolite bed acts to remove suspended matter in a down-flow softener, but not in an up-flow softener because by running the water through it at a high rate of upward flow the bed will be lifted and

loosened so that any foreign matter will pass through the bed and go out with the softened water.

The flow of 58 gallons per minute through the bed of the Graver softener in Brooklyn, that is, at the rate of 5 gallons per square foot per minute, will lift and loosen the bed, and even somewhat lower rates of flow will lift and loosen the bed to some extent, even down to 2½ gallons per square foot per minute (R. 85), but such softeners are frequently operated at lower rates of flow, depending upon the soft water requirement, and under such flows the bed would not be lifted and loosened, in which case the bed would act as in the case of the down-flow softener, so far as retention of foreign material is concerned. It will readily be seen that the several layers of graded gravel, in the Graver 1927 device, are bound to accumulate some dirt and slime as is acknowledged by Moses (R. 92)—which down-rinsing will tend to remove. Witness Moses says that in case of such low flows, respondent recommends the use of a mechanical filter in connection with the softener, so as to remove foreign material before the hard water passes to the bed. It is clear, therefore, that the zeolite bed of the Graver 1927 softener not only is capable of the function of mechanical filtration, but also does have that function under many conditions of flow (Moses, R. 92). Attention is also called to the fact that even with the use of a mechanical filter, there will be a certain amount of fine foreign material removed by the zeolite bed and forming slime therein to be removed by washing. The Graver 1927 bulletin (Pl. Ex. 4; R. 222) expressly recognizes this fact for it says, on page 7:

> "Furthermore the porous grains will in time become clogged with solid matter from the water and as it cannot be removed the softening capacity will be reduced."

The bulletin seems to assert that the Graver zeolite has less porosity and thus does not clog as quickly but

> "has a longer life than other forms" (p. 6).

Also on page 7 of this bulletin, the necessity of back-washing is recognized. Speaking of the "Graver Valve Nest" it says:

> "It may be required that one or more units be in service while others are backwashed, or that a separate source of backwash water is required. The Graver Valve Nest allows the use of these as well as any other methods ordinarily encountered in filter operation."

This is a clear recognition of filtering action and the need of backwashing in the Graver upflow softener.

The whole argument as to difference in action between the downflow and upflow softeners, in respect to retention of suspended matter, seems to be academic, however, in view of the fact that the Gans patent clearly does not teach that the zeolite bed is to be relied on for removing foreign material from the water, but makes clear that a mechanical filter may be used in advance of the zeolite bed, and shows and describes a specific embodiment of the invention having a special bed of filtering material for that purpose.

(3) *No pool of salt water remains in the 1927 softener after regenerating and washing.*

As was stated above in connection with the Graver 1925 down-flow softener, the outlet pipe of the Graver 1927 up-flow softener is not mechanically screwed into the bottom plate of the casing. But it is operatively "located at and drawing from the lowest point of the bottom" (Gans patent, p. 1, line 75; R. 585) as was the case with the respondent's softeners in the *Harvey Laundry* and *Wadham* cases. This operative connection is secured by having the outlet pipe suspended immediately at the bottom within an iron ring having notches which direct *accelerating* streams of water along the curved bottom into the outlet pipe.

Although the record testimony demonstrates this fact, Gravers's own publications assert and rely upon the *complete*

removal of all salt. For example, Graver bulletin (Pl. Ex. 4; R. 222) on page 10 thus describes this washing operation:

> "* * * hard water allowed to flow into the top of the softener and flow out to drain until *test* shows the salt is *completely* washed out." (Italics ours.)

If the salt is not removed after regeneration the device would not be ready or fit for service.

In addition (see Pl. Ex. B-10; R. 277) respondent says of the washing of this 1927 up-flow softener:

> "The process is automatic, requiring but a few hours at night, and *it leaves no salt solution in the softener.*" (Italics ours.)

The Record testimony fully supports these statements, which makes it clear that respondent has the connection recited in claim 5 and defined in the Gans patent at page 1, line 75 (quoted above), the consequence of which is (patent, p. 1, line 91):

> "* * * allowing the solution of salt after passing through the filter to pass outwardly through outlet *j* at the low point of the bottom * * *."

Claim 5 calls broadly for

> "* * * means connected to the lowest point of the casing *for removing* the salt solution so introduced, * * *." (Italics ours.)

When it is remembered that neither this respondent nor anyone else had made such a device prior to the Gans invention it seems inequitable that respondent should be permitted to reap the benefits of such invention and avoid responsibility merely by departing from the *pictured* representation of a *preferred* lay-out shown in the patent drawings, while using its full equivalent, operating in the *identical* way to secure the *identical* result.

Conclusion.

The decision below is not only in direct conflict, as to both validity and scope of the Gans patent in suit, with the decisions of the two other Courts of Appeal which had the same patent and the same evidence in all substantial respects; but it is contrary to the facts established in the record, and to the law.

It is respectfully submitted that the lower Court has committed error and that its decision is wrong; the decision should be reversed, the decree set aside and an appropriate decree entered in favor of petitioner.

Respectfully submitted,

DRURY W. COOPER,
GRAHAM SUMNER,
GEORGE A. CHRITTON,
ALLAN C. BAKEWELL,
Counsel for Petitioner.